No. 774,802. PATENTED NOV. 15, 1904.

F. S. VINCENT.

GAS GENERATOR

APPLICATION FILED OCT. 30, 1903.

NO MODEL.

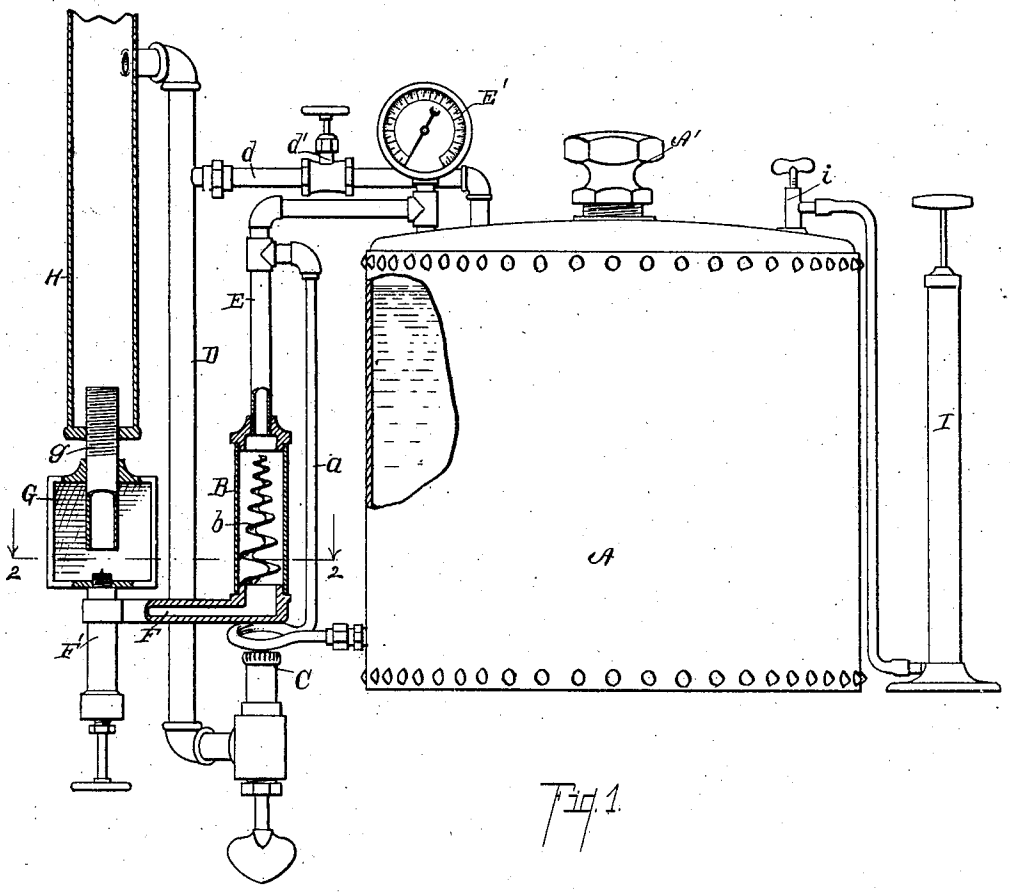


Fig. 1.

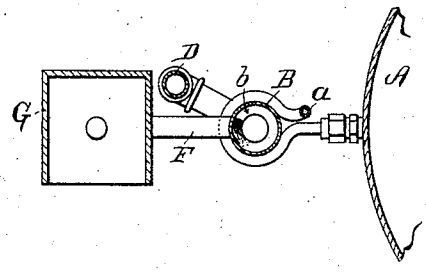


Fig. 2.

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No. 774,802. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

FRANK S. VINCENT, OF PETOSKEY, MICHIGAN, ASSIGNOR OF ONE-HALF TO ROYAL J. LYON, OF SALT LAKE CITY, UTAH.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 774,802, dated November 15, 1904.

Application filed October 30, 1903. Serial No. 179,148. (No model.)

To all whom it may concern:

Be it known that I, FRANK S. VINCENT, a citizen of the United States, residing in the city of Petoskey, in the county of Emmet and State of Michigan, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates to improvements in machines for generating gas from liquid hydrocarbons, such as gasolene and the like.

This gas-machine is especially well adapted for domestic use, although it may be used in other relations.

The objects of this invention are, first, to provide an improved machine for generating gas from hydrocarbon which produces a high grade of gas and may be operated and adjusted by an inexperienced person; second, to provide an improved machine for generating gas from hydrocarbons which after being started operates automatically; third, to provide an improved generator for gas-machines of this class; fourth, to provide an improved oil-feed device for gas-generators of this class; fifth, to provide an improved gas-generator which is simple and compact in its structure and economical to produce and use and one which is not likely to get out of repair.

Further objects and objects relating to structural details will definitely appear in the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a detail elevation view, with portions in section, of my improved gas-generating machine. Fig. 2 is a detail transverse sectional plan view taken on a line corresponding to line 2 2 of Fig. 1.

In the drawings similar letters of reference refer to similar parts throughout both views.

Referring to the lettered parts of the drawings, A is the supply tank or reservoir and is provided with suitable closure A′.

Arranged at one side of the supply-reservoir A is the generator B, which is shown in section in Fig. 1. The generator B is heated by the burner C, arranged beneath the same. A pipe E connects the top of the generator with the top of the reservoir. A suitable pressure-gage, as E′, is provided and for convenience is attached to the pipe E.

Connected to the tank or reservoir A, near the bottom, is a feed-pipe *a*, which is connected to the pipe E at a point above the level of the hydrocarbon in the supply-reservoir. The feed-pipe *a* is formed into a loop about the top of the generator-burner C, so that it is heated thereby.

The generator B is cylindrical in form, and arranged within the same is a spiral *b*, of sheet metal, which receives the oil and spreads the same and retards its flow in the generator, so that it is fully converted into vapor by the heat as it passes downwardly in the generator.

Connected to the generator is a delivery-pipe F, which is provided with a suitable delivery-nozzle F′. This delivery-nozzle F′ is provided with a needle-valve *f*, so that its delivery-opening is under perfect control.

Above the delivery-nozzle F′ is the mixing-tube *g*, which is screw-threaded into the bottom of the gas service-pipe H, so that it may be adjusted up and down to and from the top of the delivery-nozzle F′, and thereby regulate the amount of air which is mixed with the vapor. The tip of the nozzle F′ and the lower end of the mixing-tube are embraced in an intake-box G.

The burner C is connected to the gas service-pipe H by a feed-pipe D. The pipe D is connected to the top of the reservoir A by the pipe *d*. The valve *d′* is provided for controlling this pipe.

To operate the apparatus, start it by opening the valve *d′* in the pipe *d* and pumping air into the reservoir, a hand-pump, as *l*, being provided for this purpose, with a stop-cock *i*. This supplies sufficient gas to start the generator-burner and heat the generator and also heat the hydrocarbon in the pipe *a*, which expands it and forces it over into the pipe E to the generator. When the generator

is sufficiently heated to vaporize the hydrocarbon, the delivery-nozzle F′ is opened and the escaping vapor draws sufficient air into the mixing-tube to produce the desired mixture for good combustion. By adjusting the mixing-tube *g* up and down above the delivery-nozzle the richness of the mixture is regulated. As soon as the valve *f* is opened the valve *d′* and the air-valve *i* of the pump are closed. The action of the machine is then automatic. As the feed-pipe *a* carries more hydrocarbon than is used by the generator, the excess of hydrocarbon passes back into the reservoir at the top. This heated hydrocarbon is delivered into the reservoir and sustains the pressure therein, and as the supply-pipe *a* takes the hydrocarbon from the bottom of the reservoir a circulation is maintained therein and the whole supply gradually becomes heated. Owing to the connection of the feed-pipe and the circulating-pipe E, the pressure in the reservoir is equalized, so that it does not affect the feeding of the hydrocarbon to the generator. The superheated oil for the generator readily vaporizes, so that a comparatively small amount of flame is required.

The amount of hydrocarbon fed to the generator is controlled by the valve *f* of the vapor-delivery nozzle, as it is the escaping vapor which controls the amount of oil drawn into the generator. As the connection of the feed-pipe *a* with the supply-pipe E is above the level of the liquid hydrocarbon in the reservoir, when the generator-burner is extinguished the supply of oil to the generator ceases, as it is by the expansion of the hydrocarbon in the feed-pipe *a* that the generator is fed. There is therefore no liability of the pressure in the reservoir feeding the generator when the machine is not in operation. By this arrangement the feed is regulated and there is no danger of hydrocarbon escaping through the generator, as is liable to occur in pressure-fed machines.

My improved machine is simple and economical to produce and economical to use, and the vapor generated is mixed in its heated and expanded condition with the air, so that a perfect mixture is secured. Only a small quantity of gas is consumed by the burner for the generator. It is also of great advantage in that it can be operated by an inexperienced person, which is of course of very great advantage, particularly for domestic use.

I have illustrated and described my improved machine in the form preferred by me on account of its simplicity in use and operation. I am aware, however, that it is capable of considerable structural variation without departing from my invention.

The particular form of generator shown is of special advantage on account of its small size and simplicity. Other forms of generators might be substituted, however, and I desire to claim the structure specifically as well as broadly.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a reservoir A; a generator B consisting of an upright tubular casing having a spiral formed of sheet metal supported therein; a burner C below said generator; a supply-pipe D for said burner; a service-pipe H to which said pipe D is connected; a connecting-pipe *d* from said burner supply-pipe D to the top of the reservoir A; a valve *d′* therefor; a pipe E connecting the top of said generator to the top of the supply-reservoir; a feed-pipe *a* formed into a loop about the said burner, connected to said reservoir toward the bottom, and to said pipe E at a point above the level of the liquid in said reservoir; a delivery-pipe F for said generator; a delivery-nozzle F′ for said pipe F; a suitable valve therefor; an adjustable mixing-tube above said nozzle, and means for delivering air under pressure to said reservoir, all coacting for the purpose specified.

2. The combination of a reservoir A; a generator B consisting of an upright tubular casing having a spiral formed of sheet metal supported therein; a burner C below said generator; a supply-pipe D for said burner; a service-pipe H to which said pipe D is connected; a connecting-pipe *d* from said burner supply-pipe D to the top of the reservoir A; a valve *d′* therefor; a pipe E connecting the top of said generator to the top of the supply-reservoir; a feed-pipe *a* formed into a loop about the said burner, connected to said reservoir toward the bottom and to said pipe E at a point above the level of the liquid in said reservoir; a vapor-delivery pipe F for said generator; a delivery-nozzle F′ for said pipe F; a suitable valve therefor; and an adjustable mixing-tube above said nozzle, all coacting for the purpose specified.

3. The combination of a reservoir A; a generator B; a generator-burner C below said generator; a supply-pipe D for said burner; a service-pipe H to which said pipe D is connected; a connecting-pipe *d* from said burner supply-pipe D to the top of the reservoir A; a valve *d′* therefor; a pipe E connecting the top of said generator to the top of the supply-reservoir; a liquid-feed pipe *a* formed into a loop about the said burner, connected to said reservoir toward the bottom and to said pipe E at a point above the level of the liquid in said reservoir; a vapor-delivery pipe F for said generator; a delivery-nozzle F′ for said pipe F; a suitable valve therefor; and an adjustable mixing-tube above said nozzle, all coacting for the purpose specified.

4. The combination of a reservoir A; a generator B consisting of an upright tubular cas-

ing having a spiral formed of sheet metal supported therein; a burner C below said generator; a supply-pipe D for said burner; a service-pipe H to which said pipe D is connected; a connecting-pipe *d* from said burner supply-pipe D to the top of the reservoir A; a valve *d'* therefor; a pipe E connecting the top of said generator to the top of the supply-reservoir; a liquid-feed pipe *a* formed into a loop about said burner, connected to said reservoir toward the bottom, and to said pipe E at a point above the level of the liquid in said resvoir; a delivery-pipe for said generator; all coacting for the purpose specified.

5. The combination of a reservoir A; a generator; a pipe E connecting said generator to said reservoir at a point above the level of the liquid; a burner for said generator; a feed-pipe for said generator connected to said reservoir toward the bottom thereof and to said pipe E at a point above the oil-level in said reservoir, arranged to be heated by said burner; a delivery-pipe for said generator having a suitable delivery-nozzle; a valve therefor; and an adjustable mixing-tube above said delivery-nozzle, for the purpose specified.

6. The combination of a reservoir; a generator; a pipe E connecting said generator to said reservoir at a point above the level of the liquid; a burner for said generator; a feed-pipe for said generator connected to said reservoir toward the bottom thereof and to said pipe E at a point above the oil-level in said reservoir, arranged to be heated by said burner; a vapor-delivery pipe for said generator having a suitable delivery-nozzle; and a valve therefor, for the purpose specified.

7. The combination of a reservoir; a generator; a pipe E connecting said generator to said reservoir at a point above the level of the liquid; a burner for said generator; a feed-pipe for said generator connected to said reservoir toward the bottom thereof and to said pipe E at a point above the oil-level in said reservoir, arranged to be heated by the said burner; a vapor-delivery pipe for said generator, for the purpose specified.

8. The combination of a reservoir; a generator; a pipe E connecting said generator to said reservoir at a point above the liquid-level thereof; a feed-pipe for said generator connected to said reservoir toward the bottom thereof, and to said pipe E at a point above the liquid-level in said oil-reservoir; means for heating said generator and said feed-pipe; means for controlling the delivery of vapors from said generator, for the purpose specified.

9. The combination of a reservoir; a generator; a pipe E connecting the said generator to said reservoir at a point above the liquid-level thereof; a feed-pipe for said generator connected to said reservoir toward the bottom thereof, and to said pipe E at a point above the liquid-level in the said oil-reservoir; means for heating said generator and said feed-pipe, for the purpose specified.

10. The combination of a reservoir; a generator having a sheet-metal spiral adapted to receive hydrocarbon supported therein; a pipe adapted to deliver hydrocarbon to the said spiral connected to said reservoir at a point above the liquid-level thereof; a feed-pipe connected to the said reservoir toward the bottom thereof, and to said first-named pipe at a point above the liquid-level in the said reservoir; and means for heating said feed-pipe and generator, for the purpose specified.

11. The combination of a reservoir; a generator consisting of an upright tubular casing, having a spiral formed of sheet metal supported therein; a heating-burner arranged below said generator; a feed-pipe for said generator adapted to be heated by said burner; connections from said generator to said reservoir, whereby an even pressure is maintained therein, for the purpose specified.

12. The combination of a reservoir; a generator consisting of a tubular casing having a sheet-metal spiral arranged therein; a feed-pipe for said generator connected to the said reservoir toward the bottom thereof; means for heating said generator and said feed-pipe; and connections from said feed-pipe to the said reservoir above the liquid-level thereof, for the purpose specified.

13. The combination of a reservoir; a generator connected to said reservoir at a point above the liquid-level thereof; a feed-pipe for said generator connected to said reservoir near its bottom, adapted to deliver to said generator, and to the top of said reservoir; and means for heating said feed-pipe and said generator, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

FRANK S. VINCENT. [L. S.]

Witnesses:
DEAN S. BURNS,
EMMA C. BURNS.